SEQUENCE LISTING

<110> Ostermann, Kai
Rodel, Gerhard

<120> SECRETION OF PROTEINS FROM YEASTS

<130> 13111-00033-US

<140> US 10/572,189
<141> 2006-03-15

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<151> 2004-09-15

<150> DE 103 42 794.5
<151> 2003-09-16

<160> 56

<170> PatentIn version 3.3

<210> 1
<211> 171
<212> DNA
<213> Schizosaccharomyces pombe

<220>
<221> CDS
<222> (1)..(171)

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Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1               5                   10                  15
tca cct att cca gtt gcc gat cct ggt gtg gtt tca gtt agc aag tca       96
Ser Pro Ile Pro Val Ala Asp Pro Gly Val Val Ser Val Ser Lys Ser
            20                  25                  30
tat gct gat ttc ctt cgt gtt tac caa agt tgg aac act ttt gct aat      144
Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe Ala Asn
        35                  40                  45
cct gat aga ccc aac ttg aaa aag cgc                                  171
Pro Asp Arg Pro Asn Leu Lys Lys Arg
    50                  55
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<210> 2
<211> 57
<212> PRT
<213> Schizosaccharomyces pombe

<400> 2
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Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1               5                   10                  15
Ser Pro Ile Pro Val Ala Asp Pro Gly Val Val Ser Val Ser Lys Ser
            20                  25                  30
Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe Ala Asn
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        35                  40                  45
Pro Asp Arg Pro Asn Leu Lys Lys Arg
    50                  55

<210>  3
<211>  60
<212>  DNA
<213>  Schizosaccharomyces pombe

<220>
<221>  CDS
<222>  (1)..(60)

<220>
<221>  sig_peptide
<222>  (1)..(60)

<400>  3
atg aag atc acc gct gtc att gcc ctt tta ttc tca ctt gct gct gcc       48
Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1               5                   10                  15
tca cct att cca                                                      60
Ser Pro Ile Pro
            20

<210>  4
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<212>  PRT
<213>  Schizosaccharomyces pombe

<400>  4
Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1               5                   10                  15
Ser Pro Ile Pro
            20

<210>  5
<211>  81
<212>  DNA
<213>  Schizosaccharomyces pombe

<220>
<221>  CDS
<222>  (1)..(81)

<400>  5
aag tca tat gct gat ttc ctt cgt gtt tac caa agt tgg aac act ttt       48
Lys Ser Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe
1               5                   10                  15
gct aat cct gat aga ccc aac ttg aaa aag cgc                           81
Ala Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg
            20                  25

<210>  6
<211>  27
<212>  PRT
<213>  Schizosaccharomyces pombe
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<400> 6
Lys Ser Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe
1 5 10 15
Ala Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg
20 25

<210> 7
<211> 78
<212> DNA
<213> Schizosaccharomyces pombe

<220>
<221> CDS
<222> (1)..(78)

<220>
<221> sig_peptide
<222> (1)..(60)

<400> 7
atg aag atc acc gct gtc att gcc ctt tta ttc tca ctt gct gct gcc 48
Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1 5 10 15
tca cct att cca gtt gcc gat cct ggt gtg 78
Ser Pro Ile Pro Val Ala Asp Pro Gly Val
20 25

<210> 8
<211> 26
<212> PRT
<213> Schizosaccharomyces pombe

<400> 8
Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1 5 10 15
Ser Pro Ile Pro Val Ala Asp Pro Gly Val
20 25

<210> 9
<211> 606
<212> DNA
<213> Schizosaccharomyces pombe

<220>
<221> CDS
<222> (1)..(606)

<400> 9
atg aag atc acc gct gtc att gcc ctt tta ttc tca ctt gct gct gcc 48
Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1 5 10 15
tca cct att cca gtt gcc gat cct ggt gtg gtt tca gtt agc aag tca 96
Ser Pro Ile Pro Val Ala Asp Pro Gly Val Val Ser Val Ser Lys Ser
20 25 30
tat gct gat ttc ctt cgt gtt tac caa agt tgg aac act ttt gct aat 144
Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe Ala Asn

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        35                  40                  45
cct gat aga ccc aac ttg aaa aag cgc gaa ttc gaa gct gct ccc gca      192
Pro Asp Arg Pro Asn Leu Lys Lys Arg Glu Phe Glu Ala Ala Pro Ala
    50                  55                  60
aaa act tat gct gat ttc ctt cgt gct tat caa agt tgg aac act ttt      240
Lys Thr Tyr Ala Asp Phe Leu Arg Ala Tyr Gln Ser Trp Asn Thr Phe
65                  70                  75                  80
gtt aat cct gac aga ccc aat ttg aaa aag cgt gag ttt gaa gct gcc      288
Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Glu Phe Glu Ala Ala
                85                  90                  95
cca gag aag agt tat gct gat ttc ctt cgt gct tac cat agt tgg aac      336
Pro Glu Lys Ser Tyr Ala Asp Phe Leu Arg Ala Tyr His Ser Trp Asn
            100                 105                 110
act ttt gtt aat cct gac aga ccc aac ttg aaa aag cgc gaa ttc gaa      384
Thr Phe Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Glu Phe Glu
        115                 120                 125
gct gct ccc gca aaa act tat gct gat ttc ctt cgt gct tac caa agt      432
Ala Ala Pro Ala Lys Thr Tyr Ala Asp Phe Leu Arg Ala Tyr Gln Ser
    130                 135                 140
tgg aac act ttt gtt aat cct gac aga ccc aac ttg aaa aag cgc act      480
Trp Asn Thr Phe Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Thr
145                 150                 155                 160
gaa gaa gat gaa gag aat gag gaa gag gat gaa gaa tac tat cgc ttt      528
Glu Glu Asp Glu Glu Asn Glu Glu Glu Asp Glu Glu Tyr Tyr Arg Phe
                165                 170                 175
ctt cag ttt tat atc atg act gtc cca gag aat tcc act att aca gat      576
Leu Gln Phe Tyr Ile Met Thr Val Pro Glu Asn Ser Thr Ile Thr Asp

            180                 185                 190
gtc aat att act gcc aaa ttt gag agc taa                              606
Val Asn Ile Thr Ala Lys Phe Glu Ser
        195                 200
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<210> 10
<211> 201
<212> PRT
<213> Schizosaccharomyces pombe

<400> 10

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Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1               5                   10                  15
Ser Pro Ile Pro Val Ala Asp Pro Gly Val Val Ser Val Ser Lys Ser
            20                  25                  30
Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe Ala Asn
        35                  40                  45
Pro Asp Arg Pro Asn Leu Lys Lys Arg Glu Phe Glu Ala Ala Pro Ala
    50                  55                  60
Lys Thr Tyr Ala Asp Phe Leu Arg Ala Tyr Gln Ser Trp Asn Thr Phe
65                  70                  75                  80
Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Glu Phe Glu Ala Ala
                85                  90                  95
Pro Glu Lys Ser Tyr Ala Asp Phe Leu Arg Ala Tyr His Ser Trp Asn
            100                 105                 110
Thr Phe Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Glu Phe Glu
        115                 120                 125
Ala Ala Pro Ala Lys Thr Tyr Ala Asp Phe Leu Arg Ala Tyr Gln Ser
    130                 135                 140
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Trp Asn Thr Phe Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Thr
145                 150                 155                 160
Glu Glu Asp Glu Glu Asn Glu Glu Glu Asp Glu Glu Tyr Tyr Arg Phe
                165                 170                 175
Leu Gln Phe Tyr Ile Met Thr Val Pro Glu Asn Ser Thr Ile Thr Asp
            180                 185                 190
Val Asn Ile Thr Ala Lys Phe Glu Ser
        195                 200
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<210> 11
<211> 156
<212> DNA
<213> Unknown

<220>
<223> HA-tag

<220>
<221> CDS
<222> (1)..(156)

<400> 11

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ctg gtt ccg cgt gga tcc atc gaa ggt cgt ggc ggc cgc atc ttt tac       48
Leu Val Pro Arg Gly Ser Ile Glu Gly Arg Gly Gly Arg Ile Phe Tyr
1               5                   10                  15
cca tac gat gtt cct gac tat gcg ggc tat ccc tat gac gtc ccg gac       96
Pro Tyr Asp Val Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro Asp
            20                  25                  30
tat gca gga tcc tat cca tat gac gtt cca gat tac gct gct cag tgc      144
Tyr Ala Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ala Gln Cys
        35                  40                  45
ggc cgc taa tag                                                     156
Gly Arg
    50
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<210> 12
<211> 50
<212> PRT
<213> Unknown

<220>
<223> HA-tag

<400> 12

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Leu Val Pro Arg Gly Ser Ile Glu Gly Arg Gly Gly Arg Ile Phe Tyr
1               5                   10                  15
Pro Tyr Asp Val Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro Asp
            20                  25                  30
Tyr Ala Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ala Gln Cys
        35                  40                  45
Gly Arg
    50
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<210> 13
<211> 354
<212> DNA
<213> Aspergillus nidulans

<220>
<221> CDS
<222> (1)..(354)

<400> 13
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ctc ccg gcc tct gcc gca aag aac gcg aag ctg gcc acc tcg gcg gcc       48
Leu Pro Ala Ser Ala Ala Lys Asn Ala Lys Leu Ala Thr Ser Ala Ala
1               5                   10                  15
ttc gcc aag cag gct gaa ggc acc acc tgc aat gtc ggc tcg atc gct       96
Phe Ala Lys Gln Ala Glu Gly Thr Thr Cys Asn Val Gly Ser Ile Ala
            20                  25                  30
tgc tgc aac tcc ccc gct gag acc aac aac gac agt ctg ttg agc ggt      144
Cys Cys Asn Ser Pro Ala Glu Thr Asn Asn Asp Ser Leu Leu Ser Gly
        35                  40                  45
ctg ctc ggt gct ggc ctt ctc aac ggg ctc tcg ggc aac act ggc agc      192
Leu Leu Gly Ala Gly Leu Leu Asn Gly Leu Ser Gly Asn Thr Gly Ser
    50                  55                  60
gcc tgc gcc aag gcg agc ttg att gac cag ctg ggt ctg ctc gct ctc      240
Ala Cys Ala Lys Ala Ser Leu Ile Asp Gln Leu Gly Leu Leu Ala Leu
65                  70                  75                  80
gtc gac cac act gag gaa ggc ccc gtc tgc aag aac atc gtc gct tgc      288
Val Asp His Thr Glu Glu Gly Pro Val Cys Lys Asn Ile Val Ala Cys
                85                  90                  95
tgc cct gag gga acc acc aac tgt gtt gcc gtc gac aac gct ggc gcc      336
Cys Pro Glu Gly Thr Thr Asn Cys Val Ala Val Asp Asn Ala Gly Ala
            100                 105                 110
ggt acc aag gct gag taa                                             354
Gly Thr Lys Ala Glu
        115
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<210> 14
<211> 117
<212> PRT
<213> Aspergillus nidulans

<400> 14
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Leu Pro Ala Ser Ala Ala Lys Asn Ala Lys Leu Ala Thr Ser Ala Ala
1               5                   10                  15
Phe Ala Lys Gln Ala Glu Gly Thr Thr Cys Asn Val Gly Ser Ile Ala
            20                  25                  30
Cys Cys Asn Ser Pro Ala Glu Thr Asn Asn Asp Ser Leu Leu Ser Gly
        35                  40                  45
Leu Leu Gly Ala Gly Leu Leu Asn Gly Leu Ser Gly Asn Thr Gly Ser
    50                  55                  60
Ala Cys Ala Lys Ala Ser Leu Ile Asp Gln Leu Gly Leu Leu Ala Leu
65                  70                  75                  80
Val Asp His Thr Glu Glu Gly Pro Val Cys Lys Asn Ile Val Ala Cys
                85                  90                  95
Cys Pro Glu Gly Thr Thr Asn Cys Val Ala Val Asp Asn Ala Gly Ala
            100                 105                 110
Gly Thr Lys Ala Glu
        115
```

<210> 15
<211> 408
<212> DNA

<213> Aspergillus nidulans

<220>
<221> CDS
<222> (1)..(408)

<400> 15
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atg cgc ttc atc gtc tct ctc ctc gcc ttc act gcc gcg gcc acc gca       48
Met Arg Phe Ile Val Ser Leu Leu Ala Phe Thr Ala Ala Ala Thr Ala
1               5                  10                  15
acc gcc ctc ccg gcc tct gcc gca aag aac gcg aag ctg gcc acc tcg       96
Thr Ala Leu Pro Ala Ser Ala Ala Lys Asn Ala Lys Leu Ala Thr Ser
            20                  25                  30
gcg gcc ttc gcc aag cag gct gaa ggc acc acc tgc aat gtc ggc tcg      144
Ala Ala Phe Ala Lys Gln Ala Glu Gly Thr Thr Cys Asn Val Gly Ser
        35                  40                  45
atc gct tgc tgc aac tcc ccc gct gag acc aac aac gac agt ctg ttg      192
Ile Ala Cys Cys Asn Ser Pro Ala Glu Thr Asn Asn Asp Ser Leu Leu
    50                  55                  60
agc ggt ctg ctc ggt gct ggc ctt ctc aac ggg ctc tcg ggc aac act      240
Ser Gly Leu Leu Gly Ala Gly Leu Leu Asn Gly Leu Ser Gly Asn Thr
65                  70                  75                  80
ggc agc gcc tgc gcc aag gcg agc ttg att gac cag ctg ggt ctg ctc      288
Gly Ser Ala Cys Ala Lys Ala Ser Leu Ile Asp Gln Leu Gly Leu Leu
                85                  90                  95
gct ctc gtc gac cac act gag gaa ggc ccc gtc tgc aag aac atc gtc      336
Ala Leu Val Asp His Thr Glu Glu Gly Pro Val Cys Lys Asn Ile Val
            100                 105                 110
gct tgc tgc cct gag gga acc acc aac tgt gtt gcc gtc gac aac gct      384
Ala Cys Cys Pro Glu Gly Thr Thr Asn Cys Val Ala Val Asp Asn Ala
        115                 120                 125
ggc gcc ggt acc aag gct gag taa                                     408
Gly Ala Gly Thr Lys Ala Glu
    130                 135
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<210> 16
<211> 135
<212> PRT
<213> Aspergillus nidulans

<400> 16
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Met Arg Phe Ile Val Ser Leu Leu Ala Phe Thr Ala Ala Ala Thr Ala
1               5                  10                  15
Thr Ala Leu Pro Ala Ser Ala Ala Lys Asn Ala Lys Leu Ala Thr Ser
            20                  25                  30
Ala Ala Phe Ala Lys Gln Ala Glu Gly Thr Thr Cys Asn Val Gly Ser
        35                  40                  45
Ile Ala Cys Cys Asn Ser Pro Ala Glu Thr Asn Asn Asp Ser Leu Leu
    50                  55                  60
Ser Gly Leu Leu Gly Ala Gly Leu Leu Asn Gly Leu Ser Gly Asn Thr
65                  70                  75                  80
Gly Ser Ala Cys Ala Lys Ala Ser Leu Ile Asp Gln Leu Gly Leu Leu
                85                  90                  95
Ala Leu Val Asp His Thr Glu Glu Gly Pro Val Cys Lys Asn Ile Val
            100                 105                 110
Ala Cys Cys Pro Glu Gly Thr Thr Asn Cys Val Ala Val Asp Asn Ala
        115                 120                 125
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Gly Ala Gly Thr Lys Ala Glu
    130                 135

<210>  17
<211>  678
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Fusion protein

<220>
<221>  CDS
<222>  (1)..(678)

<400>  17
atg aag atc acc gct gtc att gcc ctt tta ttc tca ctt gct gct gcc       48
Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1               5                  10                  15
tca cct att cca gtt gcc gat cct ggt gtg gtt tca gtt agc aag tca       96
Ser Pro Ile Pro Val Ala Asp Pro Gly Val Val Ser Val Ser Lys Ser
            20                  25                  30
tat gct gat ttc ctt cgt gtt tac caa agt tgg aac act ttt gct aat      144
Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe Ala Asn
        35                  40                  45
cct gat aga ccc aac ttg aaa aag cgc ctc ccg gcc tct gcc gca aag      192
Pro Asp Arg Pro Asn Leu Lys Lys Arg Leu Pro Ala Ser Ala Ala Lys
    50                  55                  60
aac gcg aag ctg gcc acc tcg gcg gcc ttc gcc aag cag gct gaa ggc      240
Asn Ala Lys Leu Ala Thr Ser Ala Ala Phe Ala Lys Gln Ala Glu Gly
65                  70                  75                  80
acc acc tgc aat gtc ggc tcg atc gct tgc tgc aac tcc ccc gct gag      288
Thr Thr Cys Asn Val Gly Ser Ile Ala Cys Cys Asn Ser Pro Ala Glu
                85                  90                  95
acc aac aac gac agt ctg ttg agc ggt ctg ctc ggt gct ggc ctt ctc      336
Thr Asn Asn Asp Ser Leu Leu Ser Gly Leu Leu Gly Ala Gly Leu Leu
            100                 105                 110
aac ggg ctc tcg ggc aac act ggc agc gcc tgc gcc aag gcg agc ttg      384
Asn Gly Leu Ser Gly Asn Thr Gly Ser Ala Cys Ala Lys Ala Ser Leu
        115                 120                 125
att gac cag ctg ggt ctg ctc gct ctc gtc gac cac act gag gaa ggc      432
Ile Asp Gln Leu Gly Leu Leu Ala Leu Val Asp His Thr Glu Glu Gly
    130                 135                 140
ccc gtc tgc aag aac atc gtc gct tgc tgc cct gag gga acc acc aac      480
Pro Val Cys Lys Asn Ile Val Ala Cys Cys Pro Glu Gly Thr Thr Asn
145                 150                 155                 160
tgt gtt gcc gtc gac aac gct ggc gcc ggt acc aag gct gag ctg gtt      528
Cys Val Ala Val Asp Asn Ala Gly Ala Gly Thr Lys Ala Glu Leu Val
                165                 170                 175
ccg cgt gga tcc atc gaa ggt cgt ggc ggc cgc atc ttt tac cca tac      576
Pro Arg Gly Ser Ile Glu Gly Arg Gly Gly Arg Ile Phe Tyr Pro Tyr
            180                 185                 190
gat gtt cct gac tat gcg ggc tat ccc tat gac gtc ccg gac tat gca      624
Asp Val Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
        195                 200                 205
gga tcc tat cca tat gac gtt cca gat tac gct gct cag tgc ggc cgc      672
Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ala Gln Cys Gly Arg
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    210                 215                 220
taa tag                                                                 678


<210>  18
<211>  224
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Fusion protein

<400>  18
Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1               5                   10                  15
Ser Pro Ile Pro Val Ala Asp Pro Gly Val Val Ser Val Ser Lys Ser
            20                  25                  30
Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe Ala Asn
        35                  40                  45
Pro Asp Arg Pro Asn Leu Lys Lys Arg Leu Pro Ala Ser Ala Ala Lys
    50                  55                  60
Asn Ala Lys Leu Ala Thr Ser Ala Ala Phe Ala Lys Gln Ala Glu Gly
65                  70                  75                  80
Thr Thr Cys Asn Val Gly Ser Ile Ala Cys Cys Asn Ser Pro Ala Glu
                85                  90                  95
Thr Asn Asn Asp Ser Leu Leu Ser Gly Leu Leu Gly Ala Gly Leu Leu
            100                 105                 110
Asn Gly Leu Ser Gly Asn Thr Gly Ser Ala Cys Ala Lys Ala Ser Leu
        115                 120                 125
Ile Asp Gln Leu Gly Leu Leu Ala Leu Val Asp His Thr Glu Glu Gly
    130                 135                 140
Pro Val Cys Lys Asn Ile Val Ala Cys Cys Pro Glu Gly Thr Thr Asn
145                 150                 155                 160
Cys Val Ala Val Asp Asn Ala Gly Ala Gly Thr Lys Ala Glu Leu Val
                165                 170                 175
Pro Arg Gly Ser Ile Glu Gly Arg Gly Gly Arg Ile Phe Tyr Pro Tyr
            180                 185                 190
Asp Val Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
        195                 200                 205
Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ala Gln Cys Gly Arg
    210                 215                 220

<210>  19
<211>  131
<212>  PRT
<213>  Streptomyces coelicolor

<400>  19
Met Leu Lys Lys Ala Met Val Ala Ala Ala Ala Ala Ala Ser Val Ile
1               5                   10                  15
Gly Met Ser Ala Ala Ala Ala Pro Gln Ala Leu Ala Ile Gly Asp Asp
            20                  25                  30
Asn Gly Pro Ala Val Ala Asn Gly Asn Gly Ala Glu Ser Ala Phe Gly
        35                  40                  45
Asn Ser Ala Thr Lys Gly Asp Met Ser Pro Gln Leu Ser Leu Val Glu
    50                  55                  60
Gly Thr Leu Asn Lys Pro Cys Leu Gly Val Glu Asp Val Asn Val Ala
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65 70 75 80
Val Ile Asn Leu Val Pro Ile Gln Asp Ile Asn Val Leu Ala Asp Asp
85 90 95
Leu Asn Gln Gln Cys Ala Asp Asn Ser Thr Gln Ala Lys Arg Asp Gly
100 105 110
Ala Leu Ser His Val Leu Glu Asp Leu Ser Val Leu Ser Ala Asn Gly
115 120 125
Glu Gly Arg
130

<210> 20
<211> 133
<212> PRT
<213> Streptomyces coelicolor

<400> 20
Met Ile Lys Lys Val Val Ala Tyr Ala Ala Ile Ala Ala Ser Val Met
1 5 10 15
Gly Ala Ser Ala Ala Ala Ala Pro Gln Ala Met Ala Ile Gly Asp Asp
20 25 30
Ser Gly Pro Val Ser Ala Asn Gly Asn Gly Ala Ser Gln Tyr Phe Gly
35 40 45
Asn Ser Met Thr Thr Gly Asn Met Ser Pro Gln Met Ala Leu Ile Gln
50 55 60
Gly Ser Phe Asn Lys Pro Cys Ile Ala Val Ser Asp Ile Pro Val Ser
65 70 75 80
Val Ile Gly Leu Val Pro Ile Gln Asp Leu Asn Val Leu Gly Asp Asp
85 90 95
Met Asn Gln Gln Cys Ala Glu Asn Ser Thr Gln Ala Lys Arg Asp Gly
100 105 110
Ala Leu Ala His Leu Leu Glu Asp Val Ser Ile Leu Ser Ser Asn Gly
115 120 125
Glu Gly Gly Lys Gly
130

<210> 21
<211> 112
<212> PRT
<213> Agaricus bisporus

<400> 21
Met Ile Ser Arg Val Leu Val Ala Ala Leu Val Ala Leu Pro Ala Leu
1 5 10 15
Val Thr Ala Thr Pro Ala Pro Gly Lys Pro Lys Ala Ser Ser Gln Cys
20 25 30
Asp Val Gly Glu Ile His Cys Cys Asp Thr Gln Gln Thr Pro Asp His
35 40 45
Thr Ser Ala Ala Ala Ser Gly Leu Leu Gly Val Pro Ile Asn Leu Gly
50 55 60
Ala Phe Leu Gly Phe Asp Cys Thr Pro Ile Ser Val Leu Gly Val Gly
65 70 75 80
Gly Asn Asn Cys Ala Ala Gln Pro Val Cys Cys Thr Gly Asn Gln Phe
85 90 95
Thr Ala Leu Ile Asn Ala Leu Asp Cys Ser Pro Val Asn Val Asn Leu
100 105 110

<210> 22

<211> 119
<212> PRT
<213> Agaricus bisporus

<400> 22
Met Val Ser Thr Phe Ile Thr Val Ala Lys Thr Leu Leu Val Ala Leu
1 5 10 15
Leu Phe Val Asn Ile Asn Ile Val Val Gly Thr Ala Thr Thr Gly Lys
20 25 30
His Cys Ser Thr Gly Pro Ile Glu Cys Cys Lys Gln Val Met Asp Ser
35 40 45
Lys Ser Pro Gln Ala Thr Glu Leu Leu Thr Lys Asn Gly Leu Gly Leu
50 55 60
Gly Val Leu Ala Gly Val Lys Gly Leu Val Gly Ala Asn Cys Ser Pro
65 70 75 80
Ile Thr Ala Ile Gly Ile Gly Ser Gly Ser Gln Cys Ser Gly Gln Thr
85 90 95
Val Cys Cys Gln Asn Asn Asn Phe Asn Gly Val Val Ala Ile Gly Cys
100 105 110
Thr Pro Ile Asn Ala Asn Val
115

<210> 23
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 23
cagctgggtc tgctcgctct cgtcgaccac ac 32

<210> 24
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 24
gtgtggtcga cgagagcgag cagacccagc tg 32

<210> 25
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 25
gagggaacca ccaactgtgt tgccgtcgac 30

<210> 26
<211> 30

<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 26
gtcgacggca acacagttgg tggttccctc 30

<210> 27
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 27
taataactcg agatgcgctt catcgtctct ctcc 34

<210> 28
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 28
taataaggat ccttactcag ccttggtacc ggc 33

<210> 29
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 29
ggtaccaagg ctgagctggt tccgcgtgga 30

<210> 30
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 30
tccacgcgga accagctcag ccttggtacc 30

<210> 31
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 31

attattccat ggctattagc ggccgcactg agcagc 36

<210> 32
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 32
gcctcaccta ttccactccc ggcctctgcc 30

<210> 33
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 33
ggcagaggcc gggagtggaa taggtgaggc 30

<210> 34
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 34
taatttctcg agatgaagat caccgctgtc attgcccttt tattctcac 49

<210> 35
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 35
gttgccgatc ctggtgtgct cccggcctct gcc 33

<210> 36
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 36
cacaccagga tcggcaactg gaataggtga ggc 33

<210> 37
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 37
aacttgaaaa agcgcctccc ggcctctgcc 30

<210> 38
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 38
ggcagaggcc gggaggcgct ttttcaagtt gggtc 35

<210> 39
<211> 552
<212> DNA
<213> Aspergillus nidulans

<220>
<221> CDS
<222> (1)..(288)

<220>
<221> CDS
<222> (508)..(549)

<220>
<221> intron
<222> (456)..(507)

<220>
<221> CDS
<222> (381)..(455)

<220>
<221> Intron
<222> (289)..(380)

<400> 39
atg cgc ttc atc gtc tct ctc ctc gcc ttc act gcc gcg gcc acc gca 48
Met Arg Phe Ile Val Ser Leu Leu Ala Phe Thr Ala Ala Ala Thr Ala
1 5 10 15

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acc gcc ctc ccg gcc tct gcc gca aag aac gcg aag ctg gcc acc tcg       96
Thr Ala Leu Pro Ala Ser Ala Ala Lys Asn Ala Lys Leu Ala Thr Ser
            20                  25                  30
gcg gcc ttc gcc aag cag gct gaa ggc acc acc tgc aat gtc ggc tcg      144
Ala Ala Phe Ala Lys Gln Ala Glu Gly Thr Thr Cys Asn Val Gly Ser
        35                  40                  45
atc gct tgc tgc aac tcc ccc gct gag acc aac aac gac agt ctg ttg      192
Ile Ala Cys Cys Asn Ser Pro Ala Glu Thr Asn Asn Asp Ser Leu Leu
    50                  55                  60
agc ggt ctg ctc ggt gct ggc ctt ctc aac ggg ctc tcg ggc aac act      240
Ser Gly Leu Leu Gly Ala Gly Leu Leu Asn Gly Leu Ser Gly Asn Thr
65                  70                  75                  80
ggc agc gcc tgc gcc aag gcg agc ttg att gac cag ctg ggt ctg ctc      288
Gly Ser Ala Cys Ala Lys Ala Ser Leu Ile Asp Gln Leu Gly Leu Leu
                85                  90                  95
ggtacgtgat ccccactcag tcgctcccgg agaggctgag ggaagacgag cgacggtcta    348

gaaatggtgt gctaatagat gcatgtgtgc ag ctc tcg tcg acc aca ctg agg      401
                                  Leu Ser Ser Thr Thr Leu Arg
                                                  100
aag gcc ccg tct gca aga aca tcg tcg ctt gct gcc ctg agg gaa cca      449
Lys Ala Pro Ser Ala Arg Thr Ser Ser Leu Ala Ala Leu Arg Glu Pro
    105                 110                 115
cca acg tacgtctttc agatctgcta caagtgaggc gatcaaaact aacatattcc ag    507
Pro Thr
120
tgt gtt gcc gtc gac aac gct ggc gcc ggt acc aag gct gag taa          552
Cys Val Ala Val Asp Asn Ala Gly Ala Gly Thr Lys Ala Glu
            125                 130                 135

<210>  40
<211>  135
<212>  PRT
<213>  Aspergillus nidulans

<400>  40
Met Arg Phe Ile Val Ser Leu Leu Ala Phe Thr Ala Ala Ala Thr Ala
1               5                   10                  15
Thr Ala Leu Pro Ala Ser Ala Ala Lys Asn Ala Lys Leu Ala Thr Ser
            20                  25                  30
Ala Ala Phe Ala Lys Gln Ala Glu Gly Thr Thr Cys Asn Val Gly Ser
        35                  40                  45
Ile Ala Cys Cys Asn Ser Pro Ala Glu Thr Asn Asn Asp Ser Leu Leu
    50                  55                  60
Ser Gly Leu Leu Gly Ala Gly Leu Leu Asn Gly Leu Ser Gly Asn Thr
65                  70                  75                  80
Gly Ser Ala Cys Ala Lys Ala Ser Leu Ile Asp Gln Leu Gly Leu Leu
                85                  90                  95
Leu Ser Ser Thr Thr Leu Arg Lys Ala Pro Ser Ala Arg Thr Ser Ser
            100                 105                 110
Leu Ala Ala Leu Arg Glu Pro Pro Thr Cys Val Ala Val Asp Asn Ala
        115                 120                 125
Gly Ala Gly Thr Lys Ala Glu
    130                 135

<210>  41
<211>  34
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<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer

<400> 41
taataaggat ccatgcgctt catcgtctct ctcc 34

<210> 42
<211> 129
<212> DNA
<213> Schizosaccharomyces pombe

<220>
<221> CDS
<222> (1)..(126)

<400> 42
atg gac tca atg gct aac tcc gtt tct tcc tcc tct gtc gtc aac gct 48
Met Asp Ser Met Ala Asn Ser Val Ser Ser Ser Ser Val Val Asn Ala
1 5 10 15
ggc aac aag cct gct gaa act ctt aac aag acc gtt aag aat tat acc 96
Gly Asn Lys Pro Ala Glu Thr Leu Asn Lys Thr Val Lys Asn Tyr Thr
20 25 30
ccc aag gtt cct tac atg tgt gtc att gca taa 129
Pro Lys Val Pro Tyr Met Cys Val Ile Ala
35 40

<210> 43
<211> 42
<212> PRT
<213> Schizosaccharomyces pombe

<400> 43
Met Asp Ser Met Ala Asn Ser Val Ser Ser Ser Ser Val Val Asn Ala
1 5 10 15
Gly Asn Lys Pro Ala Glu Thr Leu Asn Lys Thr Val Lys Asn Tyr Thr
20 25 30
Pro Lys Val Pro Tyr Met Cys Val Ile Ala
35 40

<210> 44
<211> 27
<212> DNA
<213> Schizosaccharomyces pombe

<400> 44
tataccccca aggttcctta catgtgt 27

<210> 45
<211> 135
<212> DNA
<213> Schizosaccharomyces pombe

<220>
<221> CDS

<222> (1)..(132)

<400> 45
atg gac tcc att gca act aac act cat tct tca tcc att gtc aat gcc 48
Met Asp Ser Ile Ala Thr Asn Thr His Ser Ser Ser Ile Val Asn Ala
1 5 10 15
tac aac aac aat cct acc gat gtt gta aaa act caa aac att aaa aat 96
Tyr Asn Asn Asn Pro Thr Asp Val Val Lys Thr Gln Asn Ile Lys Asn
20 25 30
tat act cca aag gtt cct tat atg tgt gta att gct taa 135
Tyr Thr Pro Lys Val Pro Tyr Met Cys Val Ile Ala
35 40

<210> 46
<211> 44
<212> PRT
<213> Schizosaccharomyces pombe

<400> 46
Met Asp Ser Ile Ala Thr Asn Thr His Ser Ser Ser Ile Val Asn Ala
1 5 10 15
Tyr Asn Asn Asn Pro Thr Asp Val Val Lys Thr Gln Asn Ile Lys Asn
20 25 30
Tyr Thr Pro Lys Val Pro Tyr Met Cys Val Ile Ala
35 40

<210> 47
<211> 27
<212> DNA
<213> Schizosaccharomyces pombe

<400> 47
tatactccaa aggttcctta tatgtgt 27

<210> 48
<211> 126
<212> DNA
<213> Schizosaccharomyces pombe

<220>
<221> CDS
<222> (1)..(123)

<400> 48
atg gac tca atg gct aac act gtt tct tcc tcc gtc gtt aac act ggc 48
Met Asp Ser Met Ala Asn Thr Val Ser Ser Ser Val Val Asn Thr Gly
1 5 10 15
aac aag cct tct gaa act ctt aac aag act gtt aag aat tat acc ccc 96
Asn Lys Pro Ser Glu Thr Leu Asn Lys Thr Val Lys Asn Tyr Thr Pro
20 25 30
aag gtt cct tac atg tgt gtc att gca taa 126
Lys Val Pro Tyr Met Cys Val Ile Ala
35 40

<210> 49
<211> 41
<212> PRT

<213> Schizosaccharomyces pombe

<400> 49
Met Asp Ser Met Ala Asn Thr Val Ser Ser Ser Val Val Asn Thr Gly
1 5 10 15
Asn Lys Pro Ser Glu Thr Leu Asn Lys Thr Val Lys Asn Tyr Thr Pro
20 25 30
Lys Val Pro Tyr Met Cys Val Ile Ala
35 40

<210> 50
<211> 27
<212> DNA
<213> Schizosaccharomyces pombe

<400> 50
tataccccca aggttcctta catgtgt 27

<210> 51
<211> 9
<212> PRT
<213> Schizosaccharomyces pombe

<400> 51
Tyr Thr Pro Lys Val Pro Tyr Met Cys
1 5

<210> 52
<211> 586
<212> DNA
<213> Aspergillus nidulans

<220>
<221> Intron
<222> (471)..(530)

<220>
<221> Intron
<222> (338)..(389)

<400> 52
atgaagttct ccattgctgc cgctgtcgtt gctttcgccg cctccgtcgc ggccctccct 60

cctgcccatg attcccagtt cgctggcaat ggtgttggca acaagggcaa cagcaacgtc 120

aagttccctg tccccgaaaa cgtgaccgtc aagcaggcct ccgacaagtg cggtgaccag 180

gcccagctct cttgctgcaa caaggccacg tacgccggtg acaccacaac cgttgatgag 240

ggtcttctgt ctggtgccct cagcggcctc atcggcgccg ggtctggtgc cgaaggtctt 300

ggtctcttcg atcagtgctc caagcttgat gttgctggtc agttcttcga aaatcacttt 360

cgtgatgccc caatgctaac aattaccagt cctcattggc atccaagatc ttgtcaacca 420

gaagtgcaag caaaacattg cctgctgcca gaactccccc tccagcgcgg tatgttccct 480

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tgttttacag cttattcact taaaccgatt aatctaacaa cgctcacagg atggcaacct    540

tattggtgtc ggtctccctt gcgttgccct tggctccatc ctctaa                   586


<210>  53
<211>  474
<212>  DNA
<213>  Aspergillus nidulans

<220>
<221>  CDS
<222>  (1)..(471)

<400>  53
atg aag ttc tcc att gct gcc gct gtc gtt gct ttc gcc gcc tcc gtc       48
Met Lys Phe Ser Ile Ala Ala Ala Val Val Ala Phe Ala Ala Ser Val
1               5                   10                  15
gcg gcc ctc cct cct gcc cat gat tcc cag ttc gct ggc aat ggt gtt       96
Ala Ala Leu Pro Pro Ala His Asp Ser Gln Phe Ala Gly Asn Gly Val
            20                  25                  30
ggc aac aag ggc aac agc aac gtc aag ttc cct gtc ccc gaa aac gtg      144
Gly Asn Lys Gly Asn Ser Asn Val Lys Phe Pro Val Pro Glu Asn Val
        35                  40                  45
acc gtc aag cag gcc tcc gac aag tgc ggt gac cag gcc cag ctc tct      192
Thr Val Lys Gln Ala Ser Asp Lys Cys Gly Asp Gln Ala Gln Leu Ser
    50                  55                  60
tgc tgc aac aag gcc acg tac gcc ggt gac acc aca acc gtt gat gag      240

Cys Cys Asn Lys Ala Thr Tyr Ala Gly Asp Thr Thr Thr Val Asp Glu
65                  70                  75                  80
ggt ctt ctg tct ggt gcc ctc agc ggc ctc atc ggc gcc ggg tct ggt      288
Gly Leu Leu Ser Gly Ala Leu Ser Gly Leu Ile Gly Ala Gly Ser Gly
                85                  90                  95
gcc gaa ggt ctt ggt ctc ttc gat cag tgc tcc aag ctt gat gtt gct      336
Ala Glu Gly Leu Gly Leu Phe Asp Gln Cys Ser Lys Leu Asp Val Ala
            100                 105                 110
gtc ctc att ggc atc caa gat ctt gtc aac cag aag tgc aag caa aac      384
Val Leu Ile Gly Ile Gln Asp Leu Val Asn Gln Lys Cys Lys Gln Asn
        115                 120                 125
att gcc tgc tgc cag aac tcc ccc tcc agc gcg gat ggc aac ctt att      432
Ile Ala Cys Cys Gln Asn Ser Pro Ser Ser Ala Asp Gly Asn Leu Ile
    130                 135                 140
ggt gtc ggt ctc cct tgc gtt gcc ctt ggc tcc atc ctc taa              474
Gly Val Gly Leu Pro Cys Val Ala Leu Gly Ser Ile Leu
145                 150                 155


<210>  54
<211>  157
<212>  PRT
<213>  Aspergillus nidulans

<400>  54
Met Lys Phe Ser Ile Ala Ala Ala Val Val Ala Phe Ala Ala Ser Val
1               5                   10                  15
Ala Ala Leu Pro Pro Ala His Asp Ser Gln Phe Ala Gly Asn Gly Val
```

```
            20                  25                  30
Gly Asn Lys Gly Asn Ser Asn Val Lys Phe Pro Val Pro Glu Asn Val
        35                  40                  45
Thr Val Lys Gln Ala Ser Asp Lys Cys Gly Asp Gln Ala Gln Leu Ser
    50                  55                  60
Cys Cys Asn Lys Ala Thr Tyr Ala Gly Asp Thr Thr Thr Val Asp Glu
65                  70                  75                  80
Gly Leu Leu Ser Gly Ala Leu Ser Gly Leu Ile Gly Ala Gly Ser Gly
                85                  90                  95
Ala Glu Gly Leu Gly Leu Phe Asp Gln Cys Ser Lys Leu Asp Val Ala
            100                 105                 110
Val Leu Ile Gly Ile Gln Asp Leu Val Asn Gln Lys Cys Lys Gln Asn
        115                 120                 125
Ile Ala Cys Cys Gln Asn Ser Pro Ser Ser Ala Asp Gly Asn Leu Ile
    130                 135                 140
Gly Val Gly Leu Pro Cys Val Ala Leu Gly Ser Ile Leu
145                 150                 155
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<210> 55
<211> 420
<212> DNA
<213> Aspergillus nidulans

<220>
<221> CDS
<222> (1)..(417)

<400> 55

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ctc cct cct gcc cat gat tcc cag ttc gct ggc aat ggt gtt ggc aac       48
Leu Pro Pro Ala His Asp Ser Gln Phe Ala Gly Asn Gly Val Gly Asn
1               5                   10                  15
aag ggc aac agc aac gtc aag ttc cct gtc ccc gaa aac gtg acc gtc       96
Lys Gly Asn Ser Asn Val Lys Phe Pro Val Pro Glu Asn Val Thr Val
            20                  25                  30
aag cag gcc tcc gac aag tgc ggt gac cag gcc cag ctc tct tgc tgc      144
Lys Gln Ala Ser Asp Lys Cys Gly Asp Gln Ala Gln Leu Ser Cys Cys
        35                  40                  45
aac aag gcc acg tac gcc ggt gac acc aca acc gtt gat gag ggt ctt      192
Asn Lys Ala Thr Tyr Ala Gly Asp Thr Thr Thr Val Asp Glu Gly Leu
    50                  55                  60
ctg tct ggt gcc ctc agc ggc ctc atc ggc gcc ggg tct ggt gcc gaa      240
Leu Ser Gly Ala Leu Ser Gly Leu Ile Gly Ala Gly Ser Gly Ala Glu
65                  70                  75                  80
ggt ctt ggt ctc ttc gat cag tgc tcc aag ctt gat gtt gct gtc ctc      288
Gly Leu Gly Leu Phe Asp Gln Cys Ser Lys Leu Asp Val Ala Val Leu
                85                  90                  95
att ggc atc caa gat ctt gtc aac cag aag tgc aag caa aac att gcc      336
Ile Gly Ile Gln Asp Leu Val Asn Gln Lys Cys Lys Gln Asn Ile Ala
            100                 105                 110
tgc tgc cag aac tcc ccc tcc agc gcg gat ggc aac ctt att ggt gtc      384
Cys Cys Gln Asn Ser Pro Ser Ser Ala Asp Gly Asn Leu Ile Gly Val
        115                 120                 125
ggt ctc cct tgc gtt gcc ctt ggc tcc atc ctc taa                      420
Gly Leu Pro Cys Val Ala Leu Gly Ser Ile Leu
    130                 135
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<210> 56

<211> 139
<212> PRT
<213> Aspergillus nidulans

<400> 56

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Leu Pro Pro Ala His Asp Ser Gln Phe Ala Gly Asn Gly Val Gly Asn
1               5                  10                  15
Lys Gly Asn Ser Asn Val Lys Phe Pro Val Pro Glu Asn Val Thr Val
            20                  25                  30
Lys Gln Ala Ser Asp Lys Cys Gly Asp Gln Ala Gln Leu Ser Cys Cys
        35                  40                  45
Asn Lys Ala Thr Tyr Ala Gly Asp Thr Thr Thr Val Asp Glu Gly Leu
    50                  55                  60
Leu Ser Gly Ala Leu Ser Gly Leu Ile Gly Ala Gly Ser Gly Ala Glu
65                  70                  75                  80
Gly Leu Gly Leu Phe Asp Gln Cys Ser Lys Leu Asp Val Ala Val Leu
                85                  90                  95
Ile Gly Ile Gln Asp Leu Val Asn Gln Lys Cys Lys Gln Asn Ile Ala
            100                 105                 110
Cys Cys Gln Asn Ser Pro Ser Ser Ala Asp Gly Asn Leu Ile Gly Val
        115                 120                 125
Gly Leu Pro Cys Val Ala Leu Gly Ser Ile Leu
    130                 135
```